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Harold E. Conover

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TOBACCO AND SOIL RELATIONSHIPS IN TIDEWATER
VIRGINIA TO 1670

Harold E. Conover

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OUTLINE

Central theme: Soil type and soil characteristics played a key role in the growth of Virginia's early Colonial tobacco industry.

I. Tidewater and the Chesapeake Bay Country

A. Geology of the Coastal Plain of Virginia

B. Soils of the Coastal Plain of Virginia

1. Major groups

2. Alluvial soils along the rivers

II. Arrival of the English colonists

A. The new-found land

1. Alluvial soils and virgin forest

2. First Virginians: the Indians and their agriculture

a. Subsistence crops

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III. Birth and development of the Colonial tobacco industry

A. Before John Rolfe

B. Rolfe and mild leaf

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1. Explanation of the importance of tobacco

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 - c. Soils of Tidewater south of the James River
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V. Seventeenth Century as the Golden Age of Virginia's Tidewater tobacco industry

TOBACCO AND SOIL RELATIONSHIPS IN TIDE -
WATER VIRGINIA TO 1670

From the Fall Line, the Coastal Plain of Virginia stoops slowly seaward in a series of roughly parallel terraces.¹ Westernmost is the Sunderland terrace, swelling a modest two-hundred or more feet above sea level. In the Middle Coastal Plain is the younger Wicomico terrace, and bounding on the Atlantic Ocean and Chesapeake Bay are the recently born and still wet Dismal Swamp and Princess Anne formations rising from the waves to all of twenty-five feet above sea level.² This is the region known as Tidewater, a vast expanse of sandy, loamy, clayey, and gravelly sediments deposited in layers and unconsolidated beds by the retreating waters.³

From its headwaters in the Allegheny Mountains, the James River flows southeastward through the Piedmont and Coastal Plain to the Chesapeake Bay. That part of Tidewater north of the James is the Chesapeake Bay region, geologically of the upper Sunderland formation, but including parts of all the other terraces. Here, the land gropes in a series of narrow, finger-like peninsulas southeastward, separated by deeply etched stream beds. On the level to hilly interstream divides is found some of the oldest agricultural land in America.⁴

Three major groups of soils dominate the land surface: light-colored, poorly drained soils; dark-colored, poorly drained soils; and light-colored, well drained soils. Clearly, drainage is a major agricultural problem on the Coastal Plain, and is most serious in the more seaward districts.⁵

The richest soils in Tidewater are found on the alluvial plains bordering the major streams that issue from the Piedmont. Of limited extent are the chocolate-hued Congaree, Chewacla, and Ochlockonee soils of the first bottoms, and the strong brown Wickham loams of the terraces. It was on these non-typical soils that the first English settlers landed in Virginia.⁶ They were astounded by the obvious fertility of the dark, loamy soils, "...full of glistening spangles..." and supporting forests of stout, straight-trunked oaks and chestnuts, gums and poplars, and cypress and cedars.⁷ By comparison, the upland soils seemed of poorer, thin and sandy stuff.⁸

If any one of John Smith's little band cherished thoughts that he was one of the first men to stand in the shade of this grand forest, he quickly abandoned them. On the hills overlooking the broad, slow rivers stood Indian villages, such as the large encampment at Farrar's Island on the James.⁹ In their nearby fields, the Indians raised crops of corn, beans, and various gourds and squashes. Of from twenty to one-hundred acres, these fields were almost invariably located on the fertile alluvium of the stream valleys. Perhaps the largest of these cultivated areas was at Bermuda Hundred, where the Appomattocks tribe tilled one field of several hundred acres.¹⁰ Nearer their dwellings, in smaller garden plots the savages grew a plant already familiar to the Englishmen, tobacco.¹¹

The tobacco of Powhatan's kinsmen was *Nicotiana Rustica*, more commonly known as "rabbit tobacco." The short plant yielded, albeit grudgingly, a thick leaf rebuked by the English colonists as weak and bitter in flavor.¹² The Indians, on the other hand, honored it as a magic weed, whose powers included communication with the spirits of the dead.

The same smoke that bit the tongues of the Jamestown settlers who braved the meanness of the stunted Indian weed was to be the breath of life for the ailing, little colony. Almost from the first, the colonists reasoned that if the Indians could produce tobacco, so could they.¹³ The first fruit of their labors was a shipment of poorly-cured "rabbit tobacco" to England in 1610. The English rabbits did not have the tobacco habit, and the reception among the home folk was something less than enthusiastic.¹⁴ The venture seemed to have been just so much smoke.

From the ashes was to rise the tobacco industry which one authority has called the key to most of Virginia's Colonial history.¹⁵ Unenlightened by the Surgeon General's Report, the ignorant colonists humbly tried harder.

Before 1612, a few trials had been made with seed secured in Trinidad. Their failure was surpassed only by their obscurity.¹⁶ In 1612, John Rolfe, an inveterate pipe smoker who, like many of his fellows, couldn't take it from the sassy, runty Indian weed, began to play with some seed of the milder type of tobacco being produced in the Spanish West Indies. Besides a tonic for his nicotine fever, Rolfe probably hoped to discover a potion for the economically anemic Virginia adventure.¹⁷ Of the resulting crop Ralph Hamor trumpeted, "No country under the Sunne may or doth affoord more pleasant, sweet, and strong tobacco,"¹⁸ declaring it equal to "West-Indies Trinidado or Cracus" leaf.¹⁹ Hamor's enthusiasm probably outran

his historical accuracy. Still, Rolfe's crop found a market when it arrived in England in July of the next year.²⁰

Noble England had fallen to the vicious vegetable a generation earlier, and the leaf imported from Spain's American colonies was enjoying an expanding market,²¹ in spite of the jaundiced eye already being cast on it by royalty, physicians, and the righteous, who generally shared the view that "...it is of the poysonous Sort, for it Intoxicates, Inflames, Vomits, and Purges..."²² Being such an evil commodity, how could it fail?

Fail it did not. Inoculated with the germ of financial gain, Virginians succumbed to a massive epidemic of "tobaccophilia." By 1616, mild, Virginia tobacco was the colony's "chief commodity"; by 1618, Virginia leaf took the lead in the English market, so long the exclusive franchise of the Spanish import; only fifteen years after John Rolfe's first seedlings sprang from the reddish-brown loam at Bermuda Hundred,²³ the Virginia crop reached a half-million pounds.²⁴

Why did the bronze-backed leaf so rapidly rise to dominate the Virginia economy? That it had a market is only a partial answer, for any of a number of Virginia's products found buyers in the Mother Country. There were other, better reasons. First, tobacco cured kept well; it was not readily perishable. Secondly, it enjoyed a high value per weight; this quality set it apart as the only early Virginia crop which offered the grower a profit after all shipping and handling charges were paid.²⁵ Thirdly, frontier conditions played a signal role, for in the first years in Virginia, labor was scarce, and land abundant. Unfortunately, most of the land was covered by sturdy stands of ancient, virgin timber. There was a dearth of both the tools and the manpower to convert the forest to fields. A crop was needed which produced high yields per acre, with a

high market value, for one man was able to tend only about three acres at best.²⁶ When his labor was worth £ 60 in tobacco, but only £ 10 in grain, the colonist was very likely to become a tobacco planter.²⁷ By 1650, Virginia had become the tobacco kingdom, and the planters were the lords of the leaf.²⁸

The quality of any agricultural product varies from farm to farm, and farmer to farmer. This is especially true of tobacco. In an attempt to discourage the production of low grade, trashy leaf, and thereby protect their market, Virginia's first legislators initiated an inspection system, the spirit of which yet survives. By 1620, the poorest leaf was destroyed by burning. In addition, each planter was restricted to one-thousand plants per laborer. Even more incredible, he was to top his plants so that none bore more than nine leaves.²⁹

To these restrictions, the planters reacted as farmers will. To be sure, some broke the law. Most called on King Tobacco, though, and in his wants they found their answer. Since tobacco returned the best yields on the richest, virgin land, the richest, virgin land was tendered to tobacco.³⁰ Unwittingly, the ancient planters were setting a fateful pattern for future generations of American farmers.

Under frontier conditions, and faced with a seemingly limitless supply of fresh land, advanced agricultural methods seem to languish. In what was to become the traditional American attitude toward the land, the soil was exploited in a shameful way, raped and pillaged and subjected to atrocities which finally left hundreds of thousands of acres scarred beyond reclamation. In the Southeast alone, damage was done beside which Sherman's "march to the sea" and all the waste of a tragic war pales by comparison. The first line in the grim chronicle was entered when the first plow scribed a furrow in a Tidewater hill - side over three-hundred years ago; the last line is not yet written.

In the staple crop agriculture to which Virginia's planters became married, a plot of land was tasked under the lash of the leaf for three or four years; when falling yields said the soil was too "worn out" for tobacco, it was handed down to corn and wheat. When these, too failed, the abused earth was abandoned to the healing mercies of old field pine, broom sedge, and "life everlasting."³¹ Ruinous as it was, the cultivation of tobacco aided in the epic turning Virginia's forests into farms. This was a real achievement, for the forest was either felled laboriously with the axe or the Indian method, which involved girdling the large trees, setting fires around their bases, and letting them rot and fall, and grubbing out and burning the underbrush.³² The rank weed provided the motivation for this ambitious undertaking. Without it, it is doubtful that a plantation economy could have matured.

The custom of marching the legions of leaf steadily onto new ground graced the planters' brows with one unsuspected blessing, for the spectre of soil-borne diseases which later gauntly haunted the tobacco patch was warded off by the short term tenancy of the temperamental cousin of the Jimson weed on any given plot.³³

In the 1600's, when the land was "worn out" in Virginia it was not revived by manures, but turned out to pasture, which became a euphemism for weedy, galled, brush-choked old fields.³⁴ Livestock was not abundant, while new ground seemed endless. Besides, everyone knew that tobacco made on manured ground was inferior, and with some pious, old planters it was an article of faith that manure caused tobacco to have a rank flavor.³⁵ Likewise, in the days before the Revolution the grower who practiced crop rotation was a rare duck.³⁶ Men there were who believed the best quality leaf to be that from old fields,³⁷ but the freshest land made the biggest crop.

For over one-hundred years, tobacco in Virginia would remain a "hand and hoe" crop. The plow as a weapon in the tobacco patch was to be a late-comer, arriving only in the last decades of the colonial era.³⁸ At first, the settlers followed the Indian system and dropped several tobacco seeds in hills.³⁹ Soon, though, the practices of production which have survived almost unchanged to the present were devised. The seed was planted in beds, from which the tender transplants were removed to the fields, spaced about four feet apart, and religiously hoed, topped, suckered, and wormed.⁴⁰ In August, under a hot sun the plants were cut, wilted in the field, and "cured." At first, curing was effected by laying the leaf in piles, where it "sweated," covered with marsh hay. In 1619, Thomas Lambert introduced the superior practice of air-curing the leaf on lines. With modifications, the air-cure method prevailed throughout the seventeenth century.⁴¹

In the first years tobacco was limited to the plantations along the James and York Rivers.⁴² This was due partly to the convenience of trade and travel afforded by the turgid rivers. However, equally important was the fertility of the valleys along these sluggish streams; the rich low grounds were recognized early as prime tobacco land.⁴³ In addition, Rolfe's experiments had been conducted at Bermuda Hundred on the alluvial Wickham loams. It was only natural that the planters selected soils like those which had already proven hospitable to the peculiar weed. Conversely, the uplands were ignored or avoided.⁴⁴

The rapidity with which the first planters learned to cater to the whims of the sovereign leaf is remarkable. They lost no time in concluding that tobacco disliked wet feet, observing that excess soil moisture caused the crop to "fire," and that tobacco produced on wet soils

was "non-burning.... which smokes in the pipe like leather ..."⁴⁵

The primitive planters did well to listen to the gently whispering tobacco leaves. Tobacco is especially sensitive to soil characteristics; seed of the same variety of tobacco planted in different types of soil may produce strikingly dissimilar plants.⁴⁶ Thus it was that the leaf of the first Virginians was heavy and dark, reflecting the rich, dark, alluvial soils from which it drew nourishment.⁴⁷ On a tract on the uplands in Henrico County, near the James, a type of tobacco was made that resembled that grown by the Spanish at Varinas, South America. From its reputation for producing this remarkable leaf the area came to be called Varina.⁴⁸ Probably, there were numerous minor variations in the characteristics of Virginia's early tobacco, many reflecting the different soils on which the crops were grown. However, within thirty years of the Jamestown landing two major types of tobacco were recognized.

By far the most widely grown was a dark, heavy type of leaf, known as Cronoco. Some planters cured another kind of leaf, a shorter plant, broader in the leaf, milder and noted for its sweet aroma, and called "sweet-scented." The finest sweet-scented tobacco was grown in the mellow, sandy soil of Edward Digges's "Bellfield" plantation, near Yorktown.⁴⁹ While the Cronoco variety was produced generally throughout the Chesapeake Bay country, the more delicate sweet-scented leaf was almost entirely confined to the peninsula between the York River and old, Father James. On this narrow neck the finest sweet-scented tobacco grew, the mild, aromatic leaf which commanded the peak prices in England.⁵⁰

Yet, it was not its comparatively limited production that caused sweet-scented tobacco to bring a better price than the coarser, commoner Cronoco. Rather, it was the fickle palates of the English and Continental consumers, primarily pipe smokers and snuff dippers. For this market, the milder, less biting variety was best suited.⁵¹

It would seem to have been to their advantage for the Virginia growers to concentrate on the milder, higher-priced variety. It was not quite so simple as that. Sweet-scented tobacco could only be grown successfully on light, sandy loams, whereas the heavy-bodied Oronoco tolerated a wider range of soil conditions, and especially prospered on the heavier silt loams of the river valleys.⁵² Recent experiments have demonstrated that " ... all other things being equal, a heavy, close-textured soil tends to produce a smaller, narrower, but thicker leaf than a light, open soil."⁵³ It is significant that sweet-scented tobacco was characterized by rounded, fine-veined leaves, while the bulkier Oronoco had a longer, sharper leaf, "like a fox's ear."⁵⁴ It is not impossible that both sweet-scented and Oronoco tobaccos were once a single variety, and that differences in the soils upon they were grown accounted for the variations in the cured product. Later, selective breeding may have accentuated and fixed the distinctive qualities of each.

The sharp-eyed Virginians were not blind to the connection of grey, sandy soils with bright, sweet-scented tobacco. Therefore, one wonders why they did not undertake to apply their knowledge, and shift to the production of the valuable, yellow leaf. The explanation of this apparent folly remained hidden until recently, when detailed soil surveys made it available.

The first plantations were along the major streams of Tidewater, from the James River northward; that is, in the Chesapeake Bay region. This area corresponds to what is mapped as the region of Sassafras loams and related soils. Here are the brown Sassafras soils, and the soils of the Craven, Keyport, Lenoir, Elkton, Bladen, Mattapeske, Mattapex, Bertie, Othello, Portsmouth, Woodstown, Dragston, and Fallsington series. Most have a moderately heavy clay horizon at some point in their subsoil;

many include phases with heavy loam and silt loam surfaces.⁵⁵ Thus, they were unfit for the production of sweet-scented tobacco. Included as isolated, inextensive pockets are several areas of grey, sandy loams of the Norfolk soil series, though, the three largest tracts of which occupy parts of the James-York River peninsula. A part of one of these is mapped as Norfolk coarse sandy loam, and lies along the York River northwest of Yorktown. Included within this soil area was Digges's "Bellfield," located between Philgate and Indian Field Creeks, and home of the famous "E. Dees" sweet-scented tobacco.⁵⁶

Today, the Norfolk soils are considered the finest of the Coastal Plain for bright tobacco.⁵⁷ They must have been just as prized for the cultivation of sweet-scented, bright leaf in the 1600's. The restricted acreage of this soil north of the muddy James accounted for the restricted acreage of the sweet-scented crop. It was a very physical limitation; on one occasion, Digges planted a crop on a field separated by a small brook from his customary sweet-scented acreage, and labelled the cured product "E. Dees." In jig-time he received an agitated letter from his English factor, who complained that the tobacco had not been up to snuff, and warning him not to repeat the mistake of stamping "E. Dees" on hogs - heads of any but the real thing. The soils of both fields had seemed so similar-- the error was not repeated!⁵⁸

The declining distribution of the Norfolk soils as one progresses northward from the York River helps to explain the attitude, widely subscribed to among seventeenth and eighteenth century tobacco growers, that the quality of sweet-scented tobacco declined north of the York, and south of the James.⁵⁹ In the vicinity of Yorktown, the siliceous Norfolk soils occur on 62.1 percent of the land area.⁶⁰ Matthews County,

to the North on the broad Chesapeake Bay, contains no tracts of Norfolk or related soils; of its 46,742 acres of land area, only a part of which is arable, 33,212 are too wet for the easily-drowned tobacco plant.⁶¹

Across the bay, on the Eastern Shore of Maryland, detailed soil surveys of three counties discovered no Norfolk soils. In Talbot County, 43.5 per cent of the soil area belonged to the brown, loamy Sassafras series; the rest of the topography was occupied by even heavier, and poorly drained soils.⁶²

Queen Annes County boasted 74.7 per cent of her land mass as being of the fertile Sassafras soils series; 77.8 per cent of the soils of that county were found to be loams or heavier, and 38.9 per cent were too soggy for the sensitive vegetable.⁶³ In neighboring Kent County, the heavy Sassafras silt loams alone cover 43.8 per cent of the land surface, and 26.9 per cent of the county's soils suffer from imperfect drainage.⁶⁴ The Chesapeake Bay country was not tailored for sweet-scented, mild tobacco; most of her soils were not possessed of the qualities demanded for the production of bright leaf. What is most remarkable, perhaps, is that a bright leaf tobacco industry took root there at all.

To explain the allegation that sweet-scented leaf grown south of the rolling James was inferior is most difficult. Here, the soils seem to have been preordained for bright tobacco. In the county of Isle of Wight, 44.4 per cent of the soils belong to the Norfolk or related series.⁶⁵ In Nansemond County, the figure is 28.9 per cent.⁶⁶ It was a natural bright leaf district. What fears, superstitions, or ignorance conspired to keep the tobacco planters from this area are not known; possibly dark suspicions of lands garbed in pine, as was much of this Flatwoods region, or a comparative unhealthfulness of climate made it unattractive. Very possibly, a discouraging lack of large, broad, deep rivers to serve as highways for trade and travel repelled them. In consequence, the Virginia

Coastal Plain south of the James never was annexed to the tobacco kingdom. Instead, in later years it was to be the cradle of the lowly peanut.

The seventeenth century was the golden age of Virginia's Tidewater tobacco industry. The virgin soils had not yet been exploited by a careless agriculture. Before 1670, adventurous men had not planted west of the Fall Line, where superior tobacco land waited quietly. The shadow of chronic debt to his English factor had not yet fallen on the Virginia planter. Fortunes were still to be drawn from the rich earth; there was promise in the golden leaf for ambitious pioneers. The tobacco kingdom was young, and it was Spring in Tidewater.

FOOTNOTES

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⁶³S. O. Perkins, H. B. Winant, Soil Survey of Queen Annes County, Maryland, U.S., Department of Agriculture, Series 1931, No. 3 (Washington, D.C.: Government Printing Office, 1931), p. 8.

⁶⁴H. B. Winant and J. P. Bewley, Soil Survey of Kent County, Maryland, U.S., Department of Agriculture, Series 1930, No. 3 (Washington, D.C.: Government Printing Office, 1930), p. 9.

⁶⁵R. E. Devereux, Edward Shulcum, and C. S. Simmons, Soil Survey of Isle of Wight County, Virginia, U.S., Department of Agriculture, Series 1937, No. 1 (Washington, D.C.: Government Printing Office, 1941), p. 11.

⁶⁶R. E. Devereux, G. W. Patteson, Edward Shulcum, Soil Survey of Nanse -

mond County, Virginia, U.S., Department of Agriculture, Series 1932, No. 6
(Washington, D.C.: Government Printing Office, 1932), p. 10.

*Slant reports
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ANNOTATED BIBLIOGRAPHY

Brooks, Jerome E., ed. Tobacco Its History Illustrated By the Books and Manuscripts In the Library of George Arents. 4 volumes. New York: The Rosenbach Co., 1937. 2,137 pp.

Often referred to as the Arents Tobacco Bibliography, this four volume compilation of historical outline and edited manuscripts and book excerpts probably is the finest single source available today on the subject of tobacco history in America. A fifth volume provides an index of names and sources. The entire work was printed in a limited edition of three-hundred copies.

Bruce, Philip A. Economic History of Virginia in the Seventeenth Century. Vol. I of two. New York: the MacMillan Co., 1907. 634 pp.

Long considered a stand-by work on early Colonial Virginia, Bruce is probably basically reliable. However, Bruce is very weak in his knowledge of Virginia's native flora and fauna, and makes a few mistakes in this area which would be caught by most high school students with a flair for natural history.

Burke, R. T. Avon, and Root, Aldert S. Soil Survey of the Yorktown Area, Virginia. U.S. Department of Agriculture. Survey 1905. Washington, D.C.: Government Printing Office, 1906. 28 pp.

One of the first soils studies made in Virginia, this survey was made at the time when pedology in the United States was a comparatively young science. It lacks detail, and some of the soils it maps would today be mapped as different series. Outdated, it must be read with extreme caution, preferably with the consultation of a soils expert, or a good guide to soils of the Virginia Coastal Plain.

Clay, J. W., Moore, J. R., Nickels, F. F., Perry, E. A., Perry, H. H., and Wilson, G. C. Soil Survey of Mathews County, Virginia. U.S. Department of Agriculture. Series 1958, No. 24. Washington, D.C.: Government Printing Office, 1962. 44 pp.

A modern soil survey, made with the aid of aerial reconnaissance maps, the study is highly reliable.

Clayton, E. E. "Developments in Growing Tobacco," Plant Diseases, the Yearbook of Agriculture, 1953. U.S. Department of Agriculture.

Washington, D.C.: Government Printing Office, 1953. 908 pp.

An excellent study of advances in the field of improving tobacco quality and disease resistance, and of the problems which face the tobacco grower in the struggle to grow "clean" tobacco.

Craven, Avery O. Soil Exhaustion As a Factor In the Agricultural History of Virginia & Maryland 1606-1860. Gloucester, Mass.: Peter Smith, 1965. 164 pp. Originally published at Urbana by the University of Illinois in 1926.

This book, written while few studies had been made of soils and soil erosion in the United States, is still very reliable. Craven is a little shaky in his understanding of the soils of the Virginia Coastal Plain, but otherwise most sound.

Devereux, R. E., Shulcum, Edward, and Simmons, C. S. Soil Survey of Isle of Wight County, Virginia. U.S. Department of Agriculture. Series 1937, No. 1. Washington, D.C.: Government Printing Office, 1941. 44 pp.

A good survey, new enough to be considered accurate, and representative of the soil relationships typical to the Southeastern Coastal Plain of Virginia.

Devereux, R. E., Shulcum, Edward, and Patteson, G. W. Soil Survey of Nansemond County, Virginia. U.S. Department of Agriculture. Series 1932, No. 6. Washington, D.C.: Government Printing Office, 1932. 39 pp.

This study is sound, and helpful in understanding the soil qualities of Southeastern Virginia.

Garner, W. W., Allard, H. A., and Clayton, E. E. "Superior Germ Plasm in Tobacco," Yearbook of Agriculture, 1936. U.S. Department of Agriculture. Washington, D.C.: Government Printing Office, 1936. 1,174 pp.

An excellent discourse on the relationships of soils and tobacco characteristics is included in this article. It is also of help in any study of the evolution of tobacco types.

Glover, Thomas. An Account of Virginia its Scituation, Temperature, Productions, Inhabitants, and their Manner in planting and ordering Tobacco &c. Reprinted from the Philosophical Transactions of the Royal Society, June 20, 1676. London: B. H. Blackwell, 1684 ?
31 pp.

Typical of such "accounts," this report is so brief, and limited in its comments on any one subject that it is of but slight value.

Gray, Lewis C. History of Agriculture in the Southern United States to 1860. 2 vol. Washington, D.C.: the Carnegie Institution of Washington, 1933. 942 pp.

The classic work on the subject of Southern antebellum agriculture, this massive tome is scholarly, documented, well-written, and totally reliable. Probably no study of Southern agriculture extending back past 1860 can be complete without consulting Gray.

Hamor, Ralph. A True Discourse of the Present State of Virginia. Reprinted from the London edition, 1615. Richmond: The Virginia State Library, 1957. 69 pp.

Brief but informative, Hamor will be an aid to anyone studying the first years of the Virginia experiment. If any flaw is to be mentioned, it is that the style of this book makes it hard to read.

A Handbook of Agronomy. Blacksburg, Va.: Virginia Polytechnic Institute, 1966. 177 pp.

A reference work for farmers and agronomy students, it will be useful for the student with a fairly good background in agriculture. Its value as an agricultural guide is notable; as a historical work, for which it was not intended, it has no standing.

Heimann, Robert K. Tobacco and Americans. New York: McGraw-Hill, 1960. 265 pp.

Heimann's work deals with tobacco in America from very early times (pre-Columbian) and is worth the attention of anyone interested in the history of the weed. It contains some excellent illustrations.

Herndon, G. Melvin. William Tatham and the Culture of Tobacco. Including a facsimile reprint of An Historical and Practical Essay on the Culture and Commerce of Tobacco, by William Tatham, London, 1800. Coral Gables,

Fla.: University of Miami Press, 1969. 488 pp.

The included reprint of Tatham's book, a classic, is most useful. Herndon also brings the history of tobacco from 1800 to the present time up to date in a fine fashion.

Jennings, James. A Practical Treatise on the History, Medical Properties, and Cultivation of Tobacco. London: Sherwood, Gilbert, and Piper, Paternoster-Row, 1830. 159 pp.

Jennings is only a fair account, but does indicate that the relationship between soil quality and tobacco was understood long ago.

Lutz, Francis Earle. Chesterfield An Old Virginia County. Richmond: William Byrd Press, 1954. 362 pp.

A "local" work, this is heavily burdened with irrelevant detail. For a resident of Chesterfield County who is really interested in his county's past, it is acceptable. For the general reader, it can be deadly. A person with a solid knowledge in the history of Chesterfield County can find several errors of note, such as the mislocation of a plantation by six or eight miles. It is to be read with extreme caution.

Middleton, Arthur P. Tobacco Coast. ed. by George C. Mason. Newport News, Va.: Mariners' Museum, 1953. 470 pp.

Mainly a history of Colonial commerce in Maryland and Virginia. Because tobacco figured so heavily in that commerce, it will be helpful in understanding the early tobacco industry.

Perkins, S. O., and Hershberger, Merle. Soil Survey of Talbot County, Maryland. U.S. Department of Agriculture. Series 1929, No. 8. Washington, D.C.: Government Printing Office, 1929. 21 pp.

A fairly good study of soils in a Chesapeake Bay county, it may not be completely accurate today. A newer survey would probably be more detailed, and might indicate a greater number of soil types.

Perkins, S. O., and H. B. Winant. Soil Survey of Queen Annes County, Maryland. U.S. Department of Agriculture. Series 1931, No. 3. 24 pp.

A good older soil survey, it is still probably obsolete in light of more recent work in soil science. While it is not wrong, it lacks detail--some soils would probably be listed differently on the basis of discoveries since 1931.

Robert, Joseph C. The Story of Tobacco In America. Chapel Hill, N.C.:

University of North Carolina Press, 1949. 296 pp.

A well-written, authoritative book, especially strong on the manufacture and sale of tobacco since 1860. It is probably the best single study of the cigarette industry available.

Robert, Joseph C. The Tobacco Kingdom. Durham, N.C.: Duke University Press, 1938. 270 pp.

A very good study of the tobacco industry from the Revolution to 1860, with a reliable survey of the subject in earlier, Colonial times. The work might benefit from a revision of the chapters on production to include more recent findings on the relationship between tobacco and soil characteristics.

Tilley, Nannie May. The Bright Tobacco Industry 1860-1929. Chapel Hill, N.C.: University of North Carolina Press, 1948. 714 pp.

The source for information on the bright tobacco industry. Miss Tilley is a bit weak in her understanding of soils in the first chapters.

The Tobacco Institute. Virginia & Tobacco. Washington, D.C.: The Tobacco Institute, Inc., 1960. 32 pp.

A small book that hits the highlights of the evolution of America's tobacco industry, it should not be depended upon for detailed information.

Tyler, Lyon G. Narratives of Early Virginia 1606-1625, including The General Historie of Virginia By Captain John Smith, 1624; The Fourth Book, by Captain John Smith. New York: Charles Scribner's Sons, 1907. 460 pp.

This is a good source book for information on Colonial Virginia history, and will suggest further sources.

U.S. Department of Agriculture. Atlas of American Agriculture, Physical Basis Including Land Relief, Climate, Soils, and Natural Vegetation.

Prepared under the supervision of G. E. Baker, Bureau of Agricultural Economics. Washington, D.C.: Government Printing Office, 1936.

A fine general reference guide to the major soil regions of the United States, especially valuable for its soils maps, prepared by Curtis Marbut and associates in the Soil Survey of 1931.

U.S. Department of Agriculture. Soil, the Yearbook of Agriculture, 1957.

Washington, D.C.: Government Printing Office, 1957. 744 pp.

While not a historical work, it will be enlightening to anyone with a general knowledge of agronomy and soils. In a study of agricultural history, its greatest contribution will be in helping to describe the physical setting.

U.S. Department of Agriculture. Soils and Men, the Yearbook of Agriculture,

1938. Washington, D.C.: Government Printing Office, 1938. 1,207 pp.

The greatest single study of soils in the United States, it is of inestimable value in understanding the historical agricultural problems faced by America's pioneers as they met new, different soils. Its clearly-written narration of the various soil and agricultural peculiarities of different regions bring to life the reasons they developed distinctive crops, methods, and even social institutions.

Wertenbaker, Thomas J. The Planters of Colonial Virginia. Princeton: Princeton University Press, 1922. 247 pp.

Wertenbaker's carefully documented study throws much light on the characteristics and institutions of Virginia's ancient planters. It is in a good style, and precise.

Wilkinson, Christopher. The Natural History of Coffee, Thee, Chocolate,

Tobacco in four several sections,... London: at the Black Boy over against St. Dunstan's Church in Fleetstreet, 1682. 36 pp. plus postscript.

Any information on tobacco is brief, and biased. Wilkinson's section on tobacco reads like an anti-tobacco broadside.

Winant, H. B. and Bewley, J. P. Soil Survey of Kent County, Maryland.

U.S. Department of Agriculture. Series 1930, No. 3. Washington, D.C.: Government Printing Office, 1930. 24 pp.

Like many older surveys, it would benefit from a re-study. It is accurate in its findings, but the more detailed aerial maps and modern methods would probably revise its classification of several soils. However, these revisions would in no way alter conclusions on the Soils of Kent County.

Wingo, Alfred L. Virginia's Soils and Land Use. Commonwealth of Virginia,

State Board of Education. Richmond: The Baughman Company, 1945. 320 pp.

Intended as a teaching aid in vocational agriculture courses in the public high schools, the text presents the study of soils and their use, and improved methods of tillage in a way which the layman can understand.